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ABSTRACT

With the teacher surplus encouraging training institutions to raise their selection criteria, the teacher trainees (interns) in the Stanford Secondary Teacher Education Program (STEP) could be considered to represent future populations of teacher trainees. To help ascertain the impact of this new population of teachers on education, data on the survival of 952 interns from 1960 to 1969 were collected and analyzed to determine the extent to which this select group of trainees can be placed and retained in teaching. The effect of the following variables on survival was examined: selection (sex, age, marital status, financial need, academic aptitude, and academic achievement); training (subject-matter specialty and achievement); and posttraining (ratings of the training program). Data were interpreted from the perspective of the training institution rather than that of the school districts involved. It was concluded that the interns, as a population, probably have a higher survival rate than other populations of teacher trainees. Two personal attributes of the interns, sex and age, proved to be the best predictors of survival. In some cases, additional information was provided by analyses of the other variables and by the interns' reasons for leaving teaching. (Author/JA)

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FOR RESEARCH AND DEVELOPMENT
IN TEACHING

Research and Development Memorandum No. 112

TEACHER SURVIVAL FROM THE PERSPECTIVE OF THE TRAINING INSTITUTION

Richard J. Shavelson and Robert L. Trinchero

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Introductory Statement

The Center's mission is to improve teaching in American schools. Too many teachers still employ a didactic style aimed at filling passive students with facts. The teacher's environment often prevents him from changing his style, and may indeed drive him out of the profession. And the children of the poor typically suffer from the worst teaching.

The Center uses the resources of the behavioral sciences in pursuing its objectives. Drawing primarily upon psychology and sociology, but also upon other behavioral science disciplines, the Center has formulated programs of research, development, demonstration, and dissemination in three areas. Program 1, Teaching Effectiveness, is now developing a Model Teacher Training System that can be used to train both beginning and experienced teachers in effective teaching skills. Program 2, The Environment for Teaching, is developing models of school organization and ways of evaluating teachers that will encourage teachers to become more professional and more committed. Program 3, Teaching Students from Low-Income Areas, is developing materials and procedures for motivating both students and teachers in low-income schools.

This memorandum reports research conducted by a component of the Program on Teaching Effectiveness. In this study, various selection, training, and post-training variables were examined for their effect on the probability that teacher trainees (interns in the Stanford Secondary Teacher Education Program) would enter and remain in the teaching profession or the general field of education. The information gained may facilitate the selection of trainees who will remain in teaching after mastering the skills provided in the Model Teacher Training System.

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Abstract

Teacher trainees (interns) in the Stanford Secondary Teacher Education Program (STEP) may be considered to represent future populations of teacher trainees, since the teacher surplus encourages training institutions to raise their selection criteria. To help ascertain the impact of this new population of teachers on education, data on the survival of 952 interns from 1960 to 1969 were collected and analyzed to determine the extent to which this select group of trainees can be placed and retained in teaching. The effect of the following variables on survival was examined: selection (sex, age, marital status, financial need, academic aptitude, and academic achievement); training (subject-matter specialty and achievement); and post-training (ratings of the training program). Data were interpreted from the perspective of the training institution rather than that of the school districts involved.

The interns, as a population, probably have a higher survival rate than other populations of teacher trainees. Two personal attributes of the interns, sex and age, proved to be the best predictors of survival. In some cases additional information was provided by analyses of the other variables and by the interns' reasons for leaving teaching.

TEACHER SURVIVAL FROM THE PERSPECTIVE OF THE TRAINING INSTITUTION

Richard J. Shavelson and Robert L. Trinchero

Introduction

One goal of most teacher training institutions is to graduate highly qualified teachers who will remain in the profession. The surplus of teachers in certain curriculum areas (e.g., social studies, English) and geographical locations (e.g., California) has affected the achievement of this goal in at least two ways. First, it has permitted training institutions to become more selective in whom they train than in past years, with the result that the quality of teachers graduating from these institutions can be expected to improve. Second, it has increased uncertainty about the extent to which this new population of teachers can be placed and retained in the profession, and hence about their impact on education. Since the selection criteria of the Stanford Secondary Teacher Education Program (STEP) probably approximate those to be used in the near future by other teacher training institutions, data on the placement and survival of STEP trainees (called interns) may help alleviate this uncertainty. The purposes of this study, then, were to identify selection, training, and post-training variables that predict the survival of STEP interns either in secondary school teaching or in the field of education in general, and to explore the effect of the teacher surplus on this population of teacher trainees.

In contrast with previous studies (Charters, 1970; Whitener, 1965), which examined teacher survival within a single school district, this study assumed the perspective of a training institution and analyzed the

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survival of its graduates across school districts. This means that selection and preservice training variables were examined as predictors of survival, and that survival in teaching refers to the number of consecutive years in the profession and not to the number of years in a particular school district.

Despite the change in perspective some of the findings from Charters's and Whitener's studies remain applicable. One such finding relates to the nature of teacher survival when the proportion of teachers remaining in a district is plotted at yearly intervals ("survival curves"). These survival curves have a characteristic shape indicating an initial stage (from zero to three years) of rapid separation from teaching, a secondary stage (from three to five years) of less rapid separation, and a final stage (beyond five years) of negligible separation. But while the shape of the curves remains relatively consistent, the magnitude of the separation rate (or, inversely, the survival rate) for various subpopulations of teachers varies depending on their characteristics.

Other important findings deal with personal attributes and/or institutional (school district) characteristics that might predict differences in survival rates. For example, Whitener (1965) found that age at the time of employment is the best predictor of survival; the probability that teachers will survive increases with an increase in age at employment. Both Charters (1970) and Whitener (1965) found that when age is held constant, males have higher survival rates than females. Charters (1970, p. 24) suggested that "males are exposed to a qualitatively different set of hazards than females. Some hazards like illness or death, to be sure, apply with approximately equal force to males and females, but others like the military draft or maternity are sex specific, and still others differ markedly in the probability of affecting the two sexes." He suggested, further, that factors influencing the survival of male teachers are typically economic, while factors influencing the survival of female teachers are more often associated with their culturally defined role and "cycle of life" (i.e., pre-marriage, marriage, child-bearing, completed family, and emancipation).

The implication of previous teacher survival research for the present study, then, is that certain variables moderate teacher survival, and that

these variables may be an outward manifestation of psychological and social factors as indicated by Charters (1970).

Method

Subjects

The subjects of this study were all former interns in STEP, a one-year teacher training program leading to a master's degree in education and a California teaching credential. From a population of 952 interns who attended STEP between the academic years 1959-1960 and 1968-1969, 910 or 94.6 percent were contacted or accounted for in a career patterns survey conducted between January and April of 1970.[1] Of those contacted, 709--506 women and 203 men--provided complete or near-complete data and were included in the present study. The interns represented the following five curriculum areas: mathematics (N = 66), science (N = 92), social studies (N = 246), English (N = 200), and foreign language (N = 105). The mean age of the interns in the class of 1960 was 30.8 years at the time they attended the program; mean age decreased with each succeeding class to a mean of 23.5 years for the class of 1969. The interns' mean undergraduate grade-point average was 3.02 on a scale with 4.00 as a maximum. Their mean Graduate Record Examination Verbal and Quantitative scores were 608 and 558, respectively (based on interns who entered STEP in 1964 or later).[2]

Criterion Variables

Two criterion variables were used to examine the survival of the STEP interns. The first variable is the number of years the intern

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[1] Career pattern data were gathered by structured telephone interviews (approximately 90 percent of the contacts) or mail questionnaires (approximately 10 percent). The questionnaire items were grouped into four major areas: (a) education beyond STEP, (b) occupational history, (c) demographic data, and (d) evaluation of STEP. For further details see Trinchero and Shavelson, 1971.

[2] For additional data on the interns' characteristics, see Trinchero and Shavelson (1971).

worked in full-time secondary school teaching subsequent to training. The second is the number of years the intern worked in the field of education subsequent to training. The field of education is defined to include secondary school teaching as well as education-related work such as part-time teaching, school administration, and attendance at graduate school in education. The maximum value for either criterion is ten years for the class of 1960; the minimum value is zero years, a figure indicating that the intern did not enter the field of education upon graduation. Thus the survival rate for the 1969 class is equivalent to the proportion of interns placed in secondary teaching or in the field of education upon graduation.

Predictor Variables

The predictor variables used were of three types: (a) selection, (b) training, and (c) post-training evaluation. Since one purpose of this study was to predict survival after training, variables directly under the control of the training institution were emphasized. Selection variables include the intern's age, sex, marital status, undergraduate grade-point average, Verbal and Quantitative scores on the Graduate Record Examination (when available), and application for a scholarship (a rough estimate of financial need). Training variables include subject-matter specialty and STEP grade-point average. Post-training evaluation variables include the intern's rating of his school-based supervisor and his Stanford-based supervisor.[3]

Data Analyses

The survival data were evaluated for their fit to several statistical models. Multiple regression and discriminant analysis models were eliminated because certain assumptions (e.g., multivariate normal distribution) could not be made. Instead the method for analyzing survival data recommended by Whitener (1965) and extended by Charters (1970) and Burke (1971) was used. From the survival data the cumulative proportion

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[3] A copy of the rating scale is appended in Trinchero and Shavelson (1971).

of teachers surviving at yearly intervals is calculated. These data may be plotted as "survival curves"; survival curves for various subclassifications of teachers (e.g., sex, age) can be compared. A survival curve for male interns is shown in Figure 1 (solid line). The "observed" survival curve indicates that 100 percent were available for placement in teaching upon graduation; 89 percent survived the first year, 77 percent survived the second year, and so on.

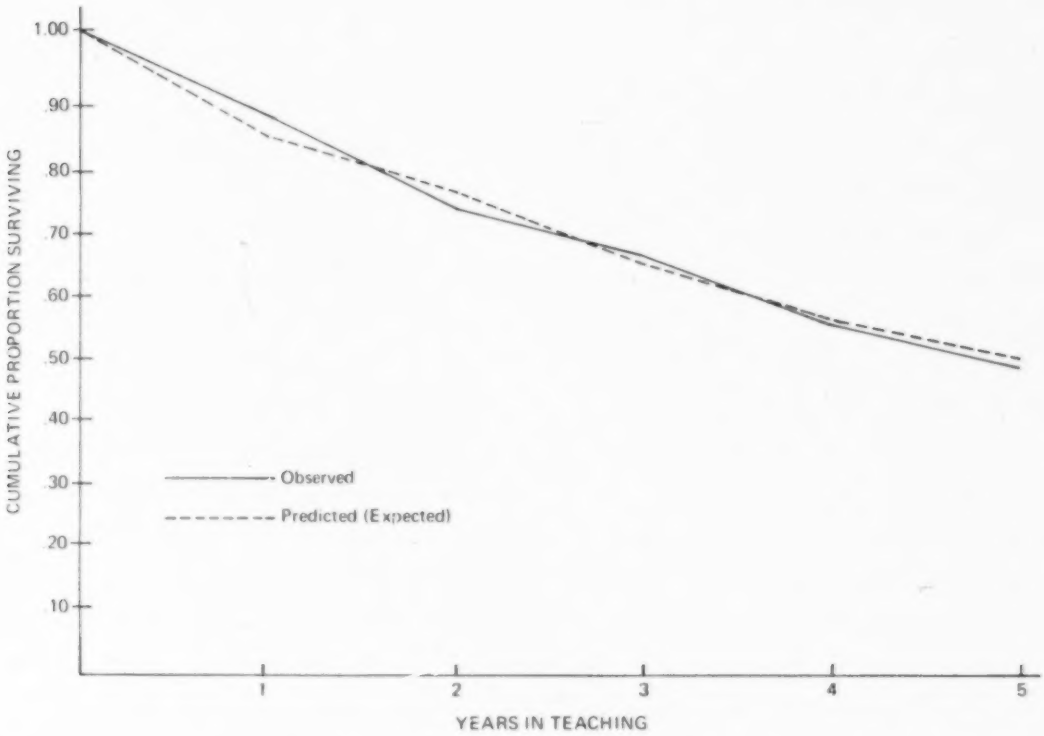

Fig. 1. Observed and predicted survival curves for males in the combined classes of 1960 to 1965.

Charters (1970; pp. 3-4) treated survival

> as a simple stochastic process with a one-way flow (Coleman, 1964) in which a teacher can be in only one of two states--employed or not employed by the district--and during an interval of time can shift from one state to another in only one direction--from employed to not employed. The probability of making such a

> shift in some small interval of time, say one year, is the separation rate, r, and when specified for the individual teacher is assumed to be an outward manifestation of underlying psychological and social processes inducing withdrawal. The inverse of the separation rate is the survival rate, q, [i.e., q = 1-r], or the probability that the teacher will remain in the same state (i.e., employed) through the time interval. If the survival rate is constant over a number of time intervals, then the successive application of the rate to a group of teachers reasonably homogeneous with regard to q will lead to a regular decrement in their numbers.

This yearly decrement of surviving teachers "is an exact fit to the exponential function

$$P_t = q^t$$

or

$$P_t = (\ln q)t,"$$

where P_t is the proportion of teachers surviving after each time interval, t, and ln is the natural logarithm (Burke, 1971, p. 375).

In Figure 1 the survival rate, q, is .87 for the male interns. The survival rate operates as follows. Suppose there were 100 interns at graduation. At the end of the first year after graduation, .87 x 100 or 87 interns are expected to survive, as shown by the broken line. At the end of the second year, .87 x 87 or 76 interns are expected to survive. And at the end of the third year, .87 x 76 or 66 are expected to survive.

The survival rate, then, can be used to summarize an observed survival curve such as that shown in Figure 1. Here, the fit of the "predicted" survival curve generated from the survival rate corresponds closely to the "observed" survival curve. But this correspondence is sensitive to the assumption of a constant survival rate over a number of yearly intervals. And, for the data presented in this paper, this assumption appears to hold where $N \geq 50$. Caution must be used in interpreting survival rates based on Ns of less than 50, especially when various trends are considered.

Results and Discussion

Comparisons with Other Populations

Interns are considered a population of teacher trainees distinct from other teacher-trainee populations, owing to the rigorous criteria

used to select interns for training. But while the intern population is unique by current standards, it may represent future trainee populations as the teacher surplus necessitates higher selection standards for training programs. Thus if measures of survival show differences between interns and other trainee populations, the data may have important implications for future institutional decisions.

Although data for comparing the survival of interns with that of other trainee populations are scarce, two such comparisons can be made. One way to determine differences in survival between interns and other teachers is to examine differences in the proportion of individuals from the two populations entering secondary school teaching--i.e., "survival upon graduating from training." In Table 1 this comparison is made between interns and a nationwide sample of teacher trainees. The data are reported by year of graduation and subject-matter specialty.

A greater proportion of interns than teacher trainees entered secondary school teaching for all years in which comparisons can be made and for all subject-matter areas considered; the one exception is science interns in 1962. The proportions for both populations remained fairly stable from 1960 to 1966. In 1967 the proportion for the nationwide sample of teacher trainees begins to drop; a similar drop begins in 1968 for interns in most subject-matter areas. Unfortunately, data for the nationwide sample are not available for the years 1968 and 1969, when intern survival was lowest. Assuming that differences in survival rates for the interns and the teacher trainees continued into 1968 and 1969, the seriousness of the teacher surplus problem on a national level is apparent, especially for certain subject-matter areas (cf. Van Dyne, 1972).

In summary, since a greater proportion of interns enter teaching the chances are that this initial advantage may influence survival rates over a number of years (assuming a constant separation rate across years). This suggests that the interns, as a group, have a higher probability of remaining in teaching than teachers nationwide.

A second way to determine whether the intern population differs in survival from other teacher populations is to compare survival rates rather than the proportion of graduates entering teaching. Only two

TABLE 1

Comparison of STEP Interns and a National Sample of Graduates Entering Secondary School Teaching, by Year and Subject-Matter Specialty

Subject-Matter Specialty	1960		1961		1962		1963		1964		1965		1966		1967		1968		1969	
	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L	STEP	NAT'L
Math	--	.74	1.00	--	1.00	.74	1.00	--	.83	.74	.86	--	1.00	.71	.78	.69	1.00	--	.78	--
Science	--	.71	.75	--	.62	.74	1.00	--	.80	.67	1.00	--	.72	.70	.77	.65	.86	--	.83	--
Social Studies	.89	.65	.89	--	.93	.64	.91	--	.91	.61	.87	--	.77	.60	.81	.59	.70	--	.53	--
English	1.00	.74	.86	--	.77	.75	.92	--	.92	.71	.82	--	.97	.72	.81	.66	.69	--	.55	--
Foreign Language	.75	.70	.50	--	1.00	.72	.80	--	.75	.70	.88	--	.77	.69	.81	.65	.78	--	.50	--

Note: Data on the national sample were taken from National Education Association, Research Division, Teacher supply and demand in public schools, Research Report 1969-R4. Washington, D. C.: NEA, 1969. A line in a cell indicates that no data were available.

studies of teacher survival have been reported (Charters, 1970; Whitener, 1965), however, and they differ from the present study in one significant respect. In these studies survival is defined as the number of consecutive years of teaching in one school district. In the present study survival is defined as the number of consecutive years in teaching regardless of the number of school districts. Although this comparison contains sufficient noise to make interpretation difficult, it is the only one possible.

On the average the survival rates for the intern population were higher than those for the Oregon teachers in Charters's (1970) study. The differences in these rates were small for males in the two groups and large for females (Figure 2).

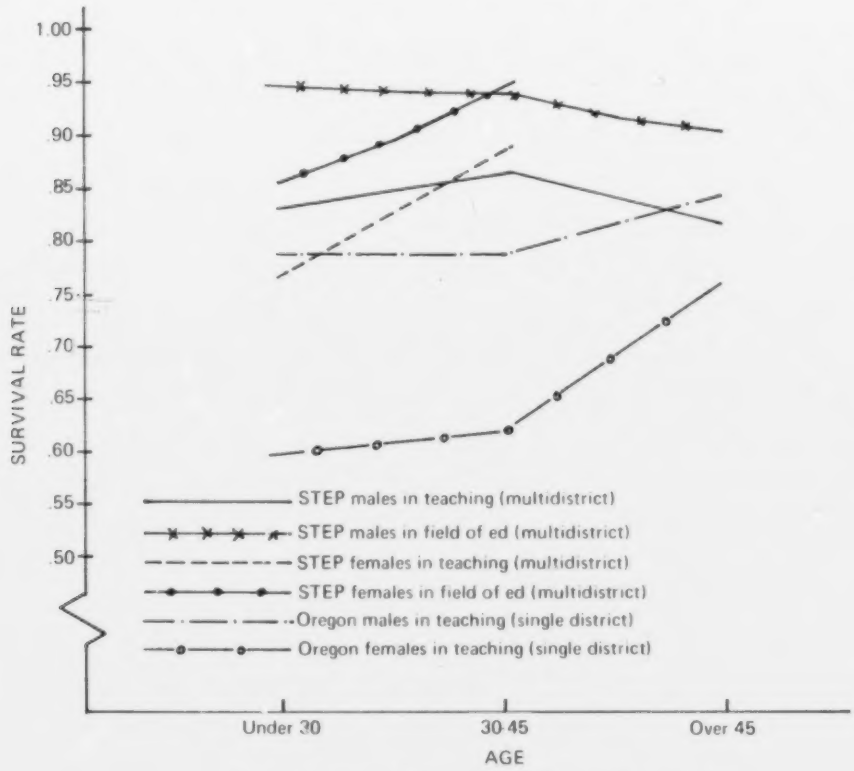

Fig. 2. Survival rates by age for STEP (multidistrict) and Oregon (single district; Charters, 1970) secondary school teachers for the early 1960's.

These findings are susceptible to a number of interpretations. One possible interpretation assumes that the single-district survival rate did not differ for the two groups. The differences between the groups, then, are attributable to the single-district versus multidistrict variable. Since males tend to survive in a single district longer than females (Charters, 1970), the single-district versus multidistrict variable influences the data more for female than for male interns.

A second possible interpretation assumes that the survival rate for male interns was lower than for male teachers in Oregon (Charters, 1970), but that there was no difference in rates for the two groups of females. If the multidistrict effect is considered constant for male and female interns, then the pattern of findings in Figure 2 is predicted.

A third possible interpretation assumes that the survival rates were higher for the interns and that the effect of the single-district versus multidistrict variable was negligible. Then one could conclude that female interns tend to have higher survival rates than male interns. (This interpretation is not supported by data reported below.)

Other interpretations based on some combination of the above are possible. The data could be said to show that the interns had a slightly higher survival rate than the Oregon teachers and that the single-district versus multidistrict variable, especially for female interns, influenced the interns' survival rates. Data from Charters (1970), his discussion of different "survival hazards" for male and female teachers, the reasons male and female interns give for leaving teaching (Trinchero & Shavelson, 1971), and the data on the proportion of interns entering teaching support this last interpretation better than any of the others.

Intern Survival Rates, 1960-1969

In Figure 3 survival rates are plotted across intern graduating classes for the two criterion variables: number of years in secondary school teaching and the number of years in the field of education. Survival data for the first six classes (1960-1965) are combined to represent survival over a five-year period. This was done for several reasons. First, survival curves are very similar for these classes over the first

five years. Second, the small number of interns in these earlier classes prohibits a detailed examination of many of the predictor variables. Third, social and economic factors (e.g., the military draft, the job market) that influence survival were assumed to be similar for interns in these classes. And fourth, the slopes of the survival curves beyond five years were essentially parallel to the abscissa; therefore an examination of factors influencing separation after five years would not be profitable.

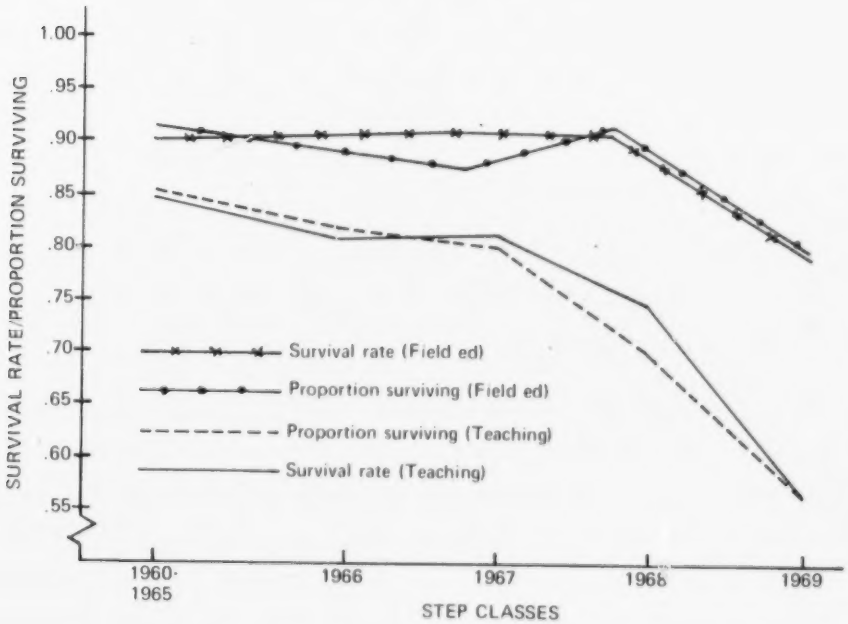

Fig. 3. Survival rates and one-year-out survival proportions on two criterion variables for all STEP classes.

In Figure 3 survival rates are compared with the proportion of interns who entered teaching or the field of education upon graduation. This comparison provides an indication of how well the survival rates fit the observed data. If the survival rates coincide exactly with the ob-

served data, the assumption of a constant decrement in survival means that the survival rates would equal the proportions. The fit between survival rates and proportions appears to be close.

Since the field of education is defined to include secondary teaching, the survival curves for the field-of-education criterion are higher than for the teaching criterion. The difference between the two sets of curves, then, represents the interns who are in some area of education other than full-time secondary teaching. These data indicate that though the interns do not necessarily enter or remain in teaching, most tend to remain in the field of education after graduation.

Finally, the survival rates for interns were high; e.g., over 50 percent of the interns who graduated between 1960 and 1965 were in teaching after three years. For the teaching criterion, survival rates decreased with each successive class. The rates were lowest for the 1968 and 1969 classes. For the field-of-education criterion, survival rates remained fairly constant until the 1969 class. Data on both criteria probably reflect, in part, the effect of the teacher surplus.

Selection Variables and Survival

Sex. Both Charters (1970) and Whitener (1965) found consistently higher survival rates for male than for female teachers. In Figure 4 survival rates are presented separately for male and female interns across class year using both survival criteria. For the teaching criterion differences in survival rates for males and females do not show a consistent trend. Survival rates for females were higher than survival rates for males in 1967 and 1968, but lower in other years. In fact, the survival rates for males steadily declined from 1965 to 1969.

One source of information to explain this finding is the interns' reasons for leaving teaching. In general, both male and female interns cited "further education" (30 percent) and "could not find a job" (15 percent) as reasons for leaving teaching. The former reason accounts directly for differences in survival rates between the teaching and field-of-education criteria. Female interns from 1960 through 1966 cited "to raise a family" as a reason for leaving (46 percent), but females in later classes and males in general rarely cited this as a reason for leaving teaching. Male interns in the classes of 1966-1968 frequently cited the

military draft as a reason for leaving (25 percent), while males in the earlier classes seldom gave this reason. And finally, males in the 1967-1968 classes cited "inadequate salary" (23 percent), while males in earlier classes and females seldom cited this reason. The pattern of differences in reasons for leaving teaching for male and female interns is consistent with Charters's (1970) hypothesis of differences in "hazards to survival" for male and female teacher. One possible explanation for the inconsistent pattern of differences in survival rates is that the military draft for the Vietnam war posed serious "hazards to survival" for males that did not exist for female interns or for the cohorts in the Charters (1970) and Whitener (1965) studies.

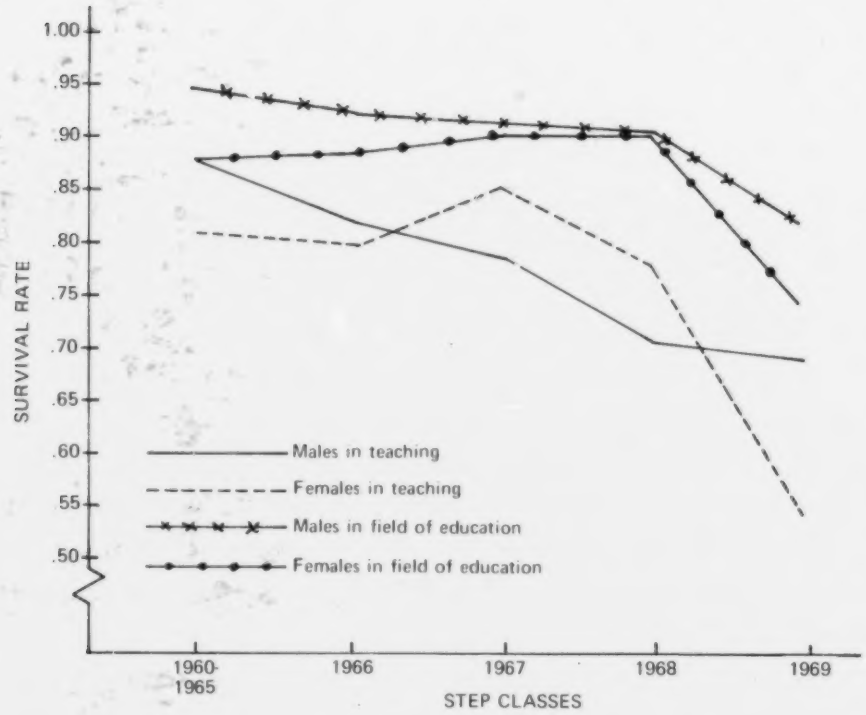

Fig. 4. Survival rates in teaching and in the field of education by STEP class year and by sex.

For the field-of-education criterion males consistently had higher survival rates than females. The differences in survival rates were smallest from 1966 through 1968, as would be expected if the military draft were an additional hazard to survival. In 1969 the proportion of female interns entering teaching decreased dramatically, probably owing to the teacher surplus. The male interns appear not to have been severely affected by the surplus.

A comparison of the curves for the teaching and field-of-education criteria (averaged across classes) suggests that males and females are about equally likely to enter education-related work. Data in Figure 4 also indicate that the number of interns moving from teaching to education-related positions increases with each succeeding year. "Intern-like" populations, then, may be more likely than teachers in general to continue their education at the doctoral level or to take administrative positions.

Age. For the classes of 1960-1965 combined, age varied sufficiently to examine its relationship to survival. For the later classes almost all interns were under 30 years old; therefore, analyses by age were not warranted. When the interns in the classes of 1960-1965 are placed into three age groups (<30, 30-45, >45) and the corresponding survival rates in teaching are plotted, the 30-45 group is shown to have had the highest survival rate ($q = .92$). The "over 45" group had a slightly higher survival rate than the "under 30" group ($q = .86$ and .81, respectively). This trend holds for the field-of-education criterion as well (for <30, $q = .89$; 30-45, $q = .95$; >45, $q = .92$).

Data are available to compare survival rates of male and female interns at two of the three age levels (<30 and 30-45); an extremely small number of female interns were over 45. This comparison shows that regardless of sex, interns between 30 and 45 years old had the highest survival rates.

The reasons are leaving teaching given by interns (1960-1965 classes) under 30 do not differ from the reasons given by interns between 30 and 45. Among males, 31 percent returned to school and 15 percent changed jobs due to a shift in interest. Among females, 51 percent left teaching to raise a family; less than 10 percent gave other reasons such as addi-

tional education, lack of a job, change of geographical location, and change of interest. Most men over 45 cited "retirement" as their reason for leaving teaching. Other reasons included inadequate salary, additional education, and dislike for teaching. For interns under 30 in the classes beyond 1965, the following were major reasons for leaving teaching: further education, raise a family, dissatisfaction with teaching, and lack of a job.

Marital status. Data on marital status were collected at the time the intern was admitted to STEP. Since few interns were divorced or widowed, this variable includes two levels: single and married. For the criterion of years in secondary teaching, the differences in survival rates between single and married interns are inconsistent (Table 2). When survival rates for the field-of-education criterion are examined, only small differences in rates are found for single and married interns.

TABLE 2

Survival Rates for Single and Married Interns
by STEP Class and Sex

	Single				Married			
	Male		Female		Male		Female	
Class	Tch	Ed	Tch	Ed	Tch	Ed	Tch	Ed
1960-1965	.86	.94	.79	.87	.87	.94	.83	.88
1966	.83	.90	.81	.89	.86	.93	.73	.87
1967	.79	.89	.88	.91	.74	.92	.70	.84
1968	.77	.92	.77	.89	a	a	.78	.91
1969	.67	.82	.63	.75	.68	.86	.57	.70

[a] $N < 10$

When survival rates for single and married interns are examined separately for males and females, the findings are as follows. The survival rates for single and married men, as measured by either survival criterion, are almost identical (differences range from .00 to .05). For single and married females, no consistent pattern of differences in survival rates is found.

Regardless of their marital status, upon matriculation, men most often cited "continued education" as their reason for leaving teaching, while women most often cited "marriage" or "raising a family" as their reason for leaving.

Academic aptitude. Verbal and Quantitative scores on the Graduate Record Examination (GREV and GREQ, respectively) were used as measures of academic aptitude. Survival rates for interns were examined at six levels of GREV and GREQ (<450, 450-549, 550-599, 600-649, 650-699, >699). Regardless of criterion, survival rates appeared to be independent of GREV. Thus, persons with low GREV scores are just as likely to remain in teaching or education as persons with high GREV scores. The number of interns studied was too small to examine these data separately for males and females.

The findings for the GREQ variable are similar to those for the GREV, except for the 1969 class. In the 1969 class survival rates (i.e., proportion of interns entering teaching or education) were higher for persons with GREQ scores above 650 than for persons with scores below ($q = .75$ and .55, respectively). In part, this finding is related to the intern's subject-matter specialty, since interns in math and science tend to have higher GREQ scores than interns in other specialties (Trinchero & Shavelson, 1971). Moreover, interns in math and science tend to be least affected by the teacher surplus (Table 1). Again, the number of interns studied was too small to examine the data separately for males and females.

For each level of GREV and GREQ scores, the same reasons for leaving teaching were given, namely, "continued education" and "marriage" or "raising a family."

Undergraduate grade-point average. Undergraduate grade-point average (UGPA) was used as a measure of academic achievement. Survival rates were

examined at four levels of UGPA (<2.5, 2.5-3.0, 3.1-3.5, >3.5). For the <2.5 group, survival rates were not calculated, since fewer than ten interns in each class belonged in this category. In general, survival rates were approximately the same for each level of UGPA. When UGPA was examined separately for males and females, no additional information was gained. Finally, the reasons for leaving teaching add no additional information on this variable.

Since interns tend to have higher survival rates than other populations of teachers (the few data available suggest this), and since the interns can be distinguished from other teachers by their high academic aptitude and achievement, one might reasonably expect aptitude and achievement variables to be important predictors of survival. But this is not the case. Survival is relatively unaffected by the aptitude and achievement variables.

Financial need. An intern's request for a scholarship may be interpreted as a gross indicator of financial need. In Figure 5 survival rates are plotted separately for interns who requested scholarships and for those who did not. Except for the 1969 class, differences in survival rates for interns in these two groups were negligible. For the 1969 class, the proportion of interns entering secondary teaching was much smaller for those who did not request scholarships than for those who did (the difference is approximately .30). However, the proportion of interns in each group entering the field of education was approximately the same (difference of .05). This suggests that interns who do not request financial support tend to move into education-related work. Although data on the 1969 interns' reasons for leaving teaching are scarce, they may help explain these findings. The same percentage of interns in each group reported "continued education" and "dissatisfaction" as reasons for leaving (25 percent of each group on each reason). Twenty-five percent of the interns (all females) who did not request scholarships cited "marriage" or "raising a family" as their reason for leaving teaching. These interns probably found part-time work in education and may account for the fact that the groups did not differ on the field-of-education variable. Finally, 20 percent of the interns who did request scholarships cited "lack of job

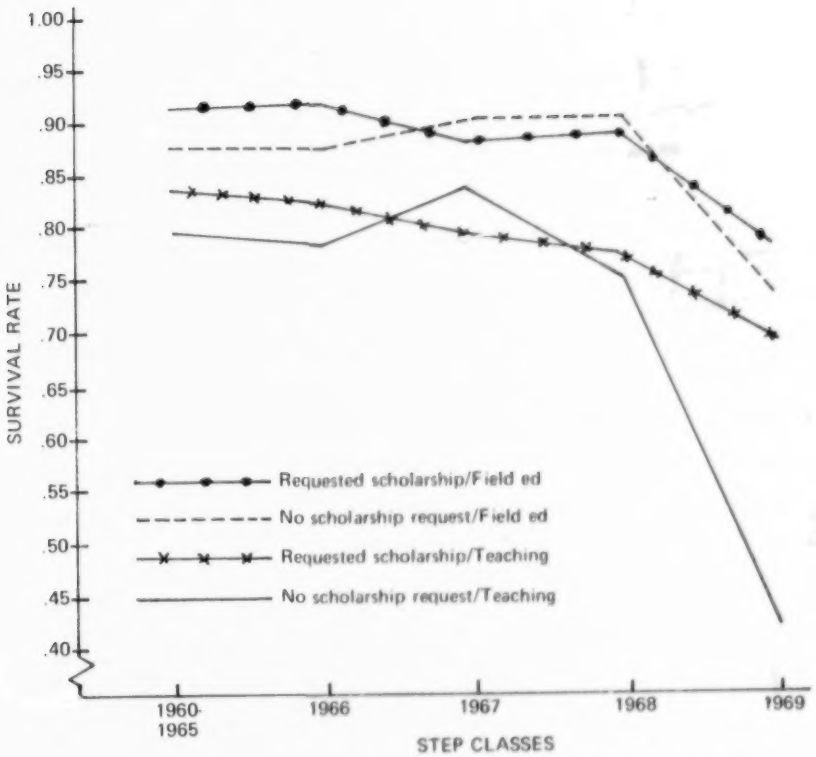

Fig. 5. Survival rates by scholarship request for all STEP classes.

availability" as their reason for leaving teaching. Perhaps this group sought jobs outside of education because of financial necessity.

Training Variables and Survival

Subject-matter specialty. Survival rates for interns in four of the five subject-matter (S-M) specialties are presented in Figure 6 for the teaching criterion. The fifth area, mathematics, had too few interns to estimate survival rates except for the 1960-1965 classes combined (q = .86).

All survival rates in Figure 6 are about the same (maximum difference = .08) for the classes prior to the 1968 class. The survival rates of the 1968 class were adversely affected by the surplus of teachers in social studies and English. For the 1969 class, the trend continued for social

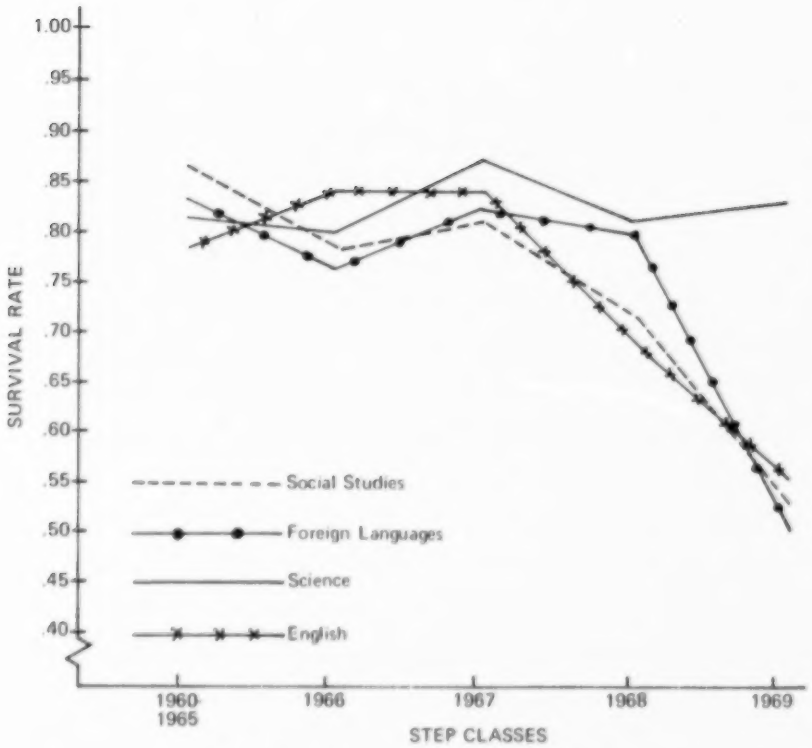

Fig. 6. Survival rates by subject matter area for all STEP classes (teaching criterion).

studies and English interns and also affected interns in foreign-language teaching. But survival rates for interns in science appears to have been unaffected. When the field-of-education survival criterion is used, the survival rates are of course greater, but the same survival patterns emerge. Interns in foreign-language teaching have the greatest tendency to move from secondary school teaching to education-related work.

The number of interns studied was too small to examine the data on S-M specialties separately for males and females. (In large part, then, the data reported above are based on the survival of female interns.) For the 1960-1965 classes combined, data for females are complete but survival rates cannot be estimated for males in English and foreign language. When survival rates in teaching for males and females are compared

for the remaining S-M specialties, males are found to have had higher survival rates than females in science (.85 and .75, respectively) and social studies (.89 and .83, respectively). For mathematics, no differences between males and females are found (.87 and .86, respectively).

The reasons for leaving teaching were similar for interns in each S-M area. Both males and females cited additional education and dissatisfaction with teaching as reasons for leaving. Females also cited marriage and family as reasons; males also cited military service.

Stanford grade-point average. Stanford grade-point average (SGPA) were converted from a continuous to a discrete variable with the same intervals as the UGPA variable. When survival rates are examined for each level of SGPA, the data for all classes are about the same. Survival rates range between .78 and .83 for the teaching criterion, and between .87 and .96 for the field-of-education criterion. The one exception to this finding is the interns in the class of 1967 with SGPA's <3.0; their survival rate in teaching is .94, and in the field of education, .95. In general, then, SGPA did not influence survival rates for these classes; interns' reasons for leaving teaching do not offer additional insight.

Post-training Variables and Survival

The post-training variables consisted of interns' ratings of various aspects of their training program.[4] Of the ten variables, only two--ratings of resident (school-based) and Stanford (university-based) supervisors--predicted survival in preliminary analyses. The results of more detailed analyses are reported below.

Rating of resident supervisor. The interns rated the "usefulness" of the training provided by the resident supervisor on a five-point scale ($\bar{X}$ = 3.37). Survival rates in secondary school teaching and in the field of education were calculated for each of the five levels of the rating scale. For the classes of 1960-1967 ratings of resident supervisors and survival rates in teaching appear to be independent of one another. For the 1968 and 1969 classes interns who gave their resident supervisors low

[4]See Trinchero and Shavelson (1971) for an analysis of mean scores.

ratings of 1 or 2 tended to have lower survival rates (.62 for the 1968 class and .44 for the 1969 class) than interns who gave them high ratings of 4 or 5 (.82 for the 1968 class and .66 for the 1969 class). Since interns commonly find permanent jobs in schools where they have interned, negative experiences with school-based supervisors may tend to decrease the chances for employment in that school. In the depressed job market faced by the classes of 1968 and 1969 this variable may have taken on particular importance. Using the field-of-education criterion, ratings of the resident supervisor are independent of survival rates for these two classes. Again, reasons given by interns for leaving teaching provide no additional information on the rating variable.

Rating of Stanford supervisor. The interns rated the "usefulness" of the Stanford supervisor on a five-point scale ($\bar{X}$ = 3.74). For classes prior to 1969 high survival rates in teaching and education are associated with positive ratings of Stanford supervisors (e.g., differences in survival rates between interns who gave negative ratings and those who gave positive ratings range from .01-.09). For the class of 1969, however, high survival rates in teaching and education are associated with negative ratings (the survival rates in teaching were .75 and .53 for negative and positive ratings, respectively, while the survival rates in education were .85 and .73, respectively). With the onset of the teacher surplus, the Stanford supervisor's dual role of supervisor and doctoral student may have discouraged interns who gave high ratings from entering teaching or education-related work, such as advanced graduate study, like their supervisors. Data on interns' reasons for leaving add no additional information on this point.

Conclusions

In general, the STEP interns had high survival rates in secondary school teaching (q = .72) and in the field of education (q = .87). Approximately 10 percent of the surviving interns at the time of this study were in positions other than full-time, secondary school teaching, the position for which they were specifically trained. These 10 percent had taken ad-

ministrative positions, or were teaching part-time, or had returned to graduate school in education.

When compared to other teacher-trainee populations, there is some evidence to suggest the interns had higher survival rates. The proportion of interns entering secondary school teaching exceeded the proportion of trainees who entered secondary school teaching in a nationwide survey for comparable years and subject-matter areas. A comparison of survival rates defined from the training institution's perspective (multidistrict) as opposed to the single school district's perspective (Charters, 1970) showed higher survival rates for the former. A number of interpretations of this finding were presented. Probably the interns as a more select population of trainees have a slightly higher survival rate than the cross-section of Oregon teachers in the multidistrict study. Additionally, one would expect multidistrict rates to be higher than single-district rates, since not all teachers that leave a district leave teaching. It is noteworthy that survival rates for men were comparable regardless of whether the perspective was multidistrict or single district, while for women the multidistrict rate was higher.

More male than female interns survive in the field of education. Males do not have consistently higher survival rates than females in secondary school teaching, however. Differences in these survival data can be explained by Charters's (1970) notion of differences in "hazards to survival" for male and female teachers. Many of the factors influencing survival for female teachers, such as marriage and childbearing, differ from factors influencing survival for males, such as the military draft and the need for greater income. Thus, as expected, many men cited the military draft as a reason for leaving teaching in the years 1967 and 1968, when survival rates were greater for women than for men. Obviously as the feminist movement takes hold, traditional sex roles may undergo a substantial change and the distinction between hazards to survival for men and women may become less important. This change is evidenced in studying the female interns' reasons for leaving teaching. Prior to 1967 most females cited "raising a family" as their reason for leaving. After 1967 this reason was no longer modal.

In addition to sex, age was identified as important in predicting survival rate. Interns between the ages of 30 and 45 have higher survival rates than those younger or older. Males have higher survival rates than females. The differences in survival rates for the various age groups are greater for women than for men. The reasons given for leaving teaching do not differ for the age groups of under 30 and 30-45. Most interns over 45, men only, cite retirement as their reason for leaving teaching.

Finally, findings about the effects of other variables are briefly noted:

1. Married female interns have considerably lower survival rates than single females or males.
2. In general, traditional measures of academic aptitude (Graduate Record Examination scores) and achievement (grade-point average) do not predict interns' survival in teaching.
3. Knowledge of an intern's subject-matter specialty does not aid in predicting survival for graduates prior to the teacher surplus. During the surplus (classes of 1968 and 1969), only the science and (perhaps) mathematics subject-matter specialties appear to have been unaffected; survival decreased dramatically for other specialties.
4. In general, interns' ratings of various aspects of their training program were independent of survival rate. For the classes of 1968 and 1969, a high survival rate was associated with a positive rating of the resident (school-based) supervisor. For the 1969 class, a high survival rate was associated with a negative rating of the Stanford (university-based) supervisor.

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